



COMMONWEALTH OF MASSACHUSETTS  
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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Commissioner

**PILOTING APPROVAL**

Pursuant to Title 5, 310 CMR 15.000

Name and Address of Applicant:

OMNI Environmental Systems, Inc.  
P.O. Box 128/465 East Falmouth Hwy  
Falmouth, MA 02536

Trade name of technology and model numbers: OMNI Recirculating Sand Filter System (hereinafter the "System"). Schematic drawings illustrating the System and a technology checklist are attached and are part of this Approval.

Transmittal Number: W054298  
Date of Issuance: April 4, 2005  
Date of Expiration: April 4, 2010

**Authority for Issuance**

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental Protection hereby issues this Approval to: OMNI Environmental Systems, Inc. 465 East Falmouth Hwy, Falmouth, MA 02356 (hereinafter "the Company"), to Pilot in the Commonwealth of Massachusetts the System described herein. Sale and use of the System are conditioned on and subject to compliance by the Company and the System owner with the terms and conditions set forth below. Any noncompliance with the terms or conditions of this Approval constitutes a violation of 310 CMR 15.000.

A handwritten signature in black ink, appearing to read "Glenn Haas".

Glenn Haas, Director  
Division of Watershed Management  
Department of Environmental Protection

April 4, 2005

Date

**I. Purpose**

1. The purpose of this Approval is to provide field-testing and technical demonstration of the System in Massachusetts, on a Piloting Approval basis, so as to evaluate whether the System can effectively reduce total nitrogen (TN) in the effluent to 19 milligrams per liter (mg/L) or less and to evaluate whether the System can provide an effluent that can be discharged to the soil absorption system (SAS) at increased loading rates.
2. With the necessary permits and approvals required by 310 CMR 15.000, this Piloting Approval authorizes the use and installation of the System in Massachusetts, and requires testing so that the Department can determine whether the System consistently can or cannot function effectively at one or more pilot facilities.
3. The System may only be installed on facilities that meet the criteria of 310 CMR 15.285(2).
4. This Piloting Approval authorizes the use of the System, with the approval of the local approving authority, for upgrades of existing failed, failing or substandard systems and for new construction for systems with design flows less than 10,000 gallons per day.

**II. Design Standards**

1. The System consists of a recirculating sand filter module filled with a 3/8 inch fractured double washed stone filter media. Effluent from a minimum 1000-gallon recirculation tank is applied to the filter. The flow from the recirculation tank is pumped via timed dosing to a distribution structure on the surface of the recirculating sand filter. This pressure dosing aerates the liquid. The filtered effluent is collected in an underdrain system. Up to 50 percent of the filtered effluent is returned to the recirculation tank and the remainder is returned to influent end the septic tank for denitrification. A septic tank designed in accordance with Title 5 and equipped with an approved effluent tee filter discharges effluent to the recirculation tank. Approximately 75 percent of the filtrate is returned to the recirculation tank and 25 percent of the filtrate is discharged either by gravity to a Title 5 soil absorption system (SAS) or to a pump chamber for pressure distribution to the SAS.
2. The System shall be covered only with mulch type material. No other materials, fill or plantings shall be allowed on top of the System.
3. The System shall be provided with visible and audible alarms that are activated in event of equipment malfunction. The alarms and controls shall be housed within an enclosure mounted in a location readily accessible to the operator.

## OMNI Recirculating Sand Filter Piloting Approval

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4. All access ports and manhole covers shall be installed and maintained at grade to allow for maintenance of the System.
5. New Construction less than 2,000 gpd: When the System is used in areas subject to the nitrogen loading limitations of 310 CMR 15.214, an increase in calculated allowable nitrogen loading per acre is allowed for facilities *with a design flow of less than 2,000 gallons per day (gpd)* as provided in 310 CMR 15.217(2). When used in such areas:
  - i. for residential facilities, the design flow shall not exceed 660 gallons per day per acre (gpda), and the System shall not exceed 19 mg/L total nitrogen (TN) concentration in the effluent measured as the total TKN (total Kjeldhal Nitrogen), NO<sub>3</sub>-N (Nitrate nitrogen) and NO<sub>2</sub>-N (Nitrite nitrogen).
  - ii. for non-residential facilities, the design flow shall not exceed 550 gpda, and the System shall not exceed 25 mg/L TN concentration in the effluent.
6. New Construction 2,000 gpd to less than 10,000 gpd: For all facilities with design flows of 2,000 gpd to less than 10,000 gpd, the design flow shall not exceed 440 gpda and the System shall not exceed 25 mg/L TN concentration in the effluent.
7. Soil Absorption System: The Company seeks to demonstrate that the System can function with a SAS designed with increased loading rates by producing an effluent from the System that meets the following parameters:
  - a. Carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>) of 15 mg/L,
  - b. Total suspended solids (TSS) of 10 mg/L, and
  - c. 95 percent removal of Fecal Coliform bacteria.
  - i. The Company seeks to demonstrate that the quality of effluent discharged to an SAS reduced in size by 50 percent as compared to a standard Title 5 SAS, is likely to be at least equivalent to that of a system designed and constructed in accordance with 310 CMR 15.100 through 15.293. The Company may install Systems on remedial sites to evaluate effluent quality in accordance with the following:
    - a. **Increased Loading Rates**: SAS shall be designed to allow maximum application rates in accordance with the following table and the effluent from the System shall be monitored in accordance with Section V item 11 of this approval:

<b>Soil Textural Classes Maximum Application Rates<sup>1</sup></b>	
<i>Class</i>	<i>(GPD per sq. foot)</i>
I	1.5
II	1.2
III	0.75
IV	0.40

1. Trench configuration and pressure distribution when the System is installed on remedial sites shall be designed in accordance with Department guidance.

### **III. General Conditions**

1. No more than 15 Systems may be installed under this Approval. A representative of the Company shall be onsite to inspect and approve each System installation.
2. All provisions of 310 CMR 15.000 are applicable to the use of this System, the System owner and the Company, except those that specifically have been varied by the terms of this Approval.
3. Any required operation and maintenance shall be performed in accordance with a Department approved plan. Any required sample analysis shall be conducted by an independent U.S. EPA or DEP approved testing laboratory, or a DEP approved independent university laboratory. It is a violation of this Approval to falsify any data collected pursuant to an approved testing plan, to omit any required data or to fail to submit any report required by such plan.
4. The following table lists the monitoring requirements for Systems installed under this Approval. The following parameters shall be monitored: pH, influent biochemical oxygen demand (BOD<sub>5</sub>) and/or effluent carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>), total suspended solids (TSS), alkalinity, and TN. All monitoring data shall be submitted to the Department and local approving authority within 45 days of the sampling date.

<b>Facility Type</b>	<b>Design Flow (gpd)</b>	<b>Stream</b>	<b>Frequency</b>	<b>Sample Type</b>
Residential	< 2,000	Effluent	Monthly for at least the first three months, quarterly thereafter	Grab
Residential	≥ 2,000	Influent & Effluent	Monthly for at least the first 18 months,	Composite*
Non-residential	All	Influent & Effluent	Monthly for at least the first 18 months,	Composite*

\*Unless otherwise specified by the Department, composite shall be determined based on facility operation

5. The facility served by the System and the System itself shall be open to inspection and sampling by the Department and the local approving authority at all reasonable times.
6. In accordance with applicable law, the Department and/or the local approving authority may require the System owner to cease operation of the system and/or to take any other action as it deems necessary to protect public health, safety, welfare and the environment.

7. The Department has not determined that the performance of the System will provide a level of protection to public health and safety and the environment that is at least equivalent to that of a sewer system. Accordingly, no System shall be installed, if it is feasible to connect the facility to a sanitary sewer, unless as allowed by 310 CMR 15.004.
8. Design and installation of the System shall be in strict conformance with the Company's DEP approved plans and specifications, 310 CMR 15.000 and this Approval.

**IV. Conditions Applicable to the System Owner**

1. The System is approved in connection with the discharge of sanitary wastewater only. Any non-sanitary wastewater generated or used at the facility served by the System shall not be introduced into the System and shall be lawfully disposed of.
2. All samples shall be taken at a flowing discharge point, i.e.- distribution box, pipe entering a pump chamber or other Department approved location from the treatment unit. Any required influent sample shall be taken at a point that will provide a representative sample of the influent. Influent sampling locations shall be determined by the system designer, subject to written approval by the Department
3. Effluent discharge concentrations shall not exceed treatment standards listed in Section V item 9. For Systems designed to demonstrate increased loading rates to the SAS effluent discharge concentrations shall not exceed treatment standards listed in Section V item 11.
4. Operation and Maintenance plan and agreement:
  - i. Throughout its life, the System shall be under an operation and maintenance (O&M) agreement. The first O&M agreement shall be for at least 18 months with the Company or its licensed agents. Each subsequent O&M agreement shall be for at least one year.
  - ii. No System shall be used until an O&M plan is submitted to the Department and the local approving authority which:
    - a provides for the contracting of a person or firm competent in providing services consistent with the System's specifications and the operation and maintenance requirements specified by the designer and any specified by the Department;
    - b contains routine O&M activities specified by the Company necessary for proper operation of the System;
    - c contains procedures for notification to the Department and the local approving authority within five days of a System failure or alarm event and for corrective measures to be taken immediately;

- d provides the name of an operator, which must be a Massachusetts certified operator as required by 257 CMR 2.00, that will operate and monitor the System:
    - (1) for a System serving a facility the operator must operate and maintain the System at the frequency specified in Section III item 4 and anytime there is an alarm event; and
    - (2) contains an agreement to monitor the System for at least the first 18 months as described in Section V, items 8 through 13.
- 5. After the first 18 months of operation, if the System is approved as acceptable by the Department, the owner shall sign at least a one year agreement with any individual or firm with a Massachusetts certified operator of the appropriate grade.
  - i. Effluent discharge limits shall remain as prescribed in Section V. Should the System exceed the applicable TN limit on two consecutive sampling events, the System owner shall have the System operator submit within 60 days a report to the Department on the reasons for the exceedances with recommendations of how future violations will be prevented.
  - ii. The System owner shall submit monitoring data and O & M inspection results to the Department and the local approving authority within 45 days of each sampling date and each inspection date. The inspection results must be recorded on a DEP approved inspection form and a technology checklist. The forms must be completed and signed by the System operator.
  - iii. The System owner may request, in writing, a change in the monitoring requirements from the Department.
- 6. The System owner shall at all times have the System properly operated and maintained in accordance with the Company's and the designer's operation and maintenance requirements and this Approval.
- 7. Anytime the operator is changed, within seven days of such change, the System owner shall notify the Department and the local approving authority in writing and submit a copy of the new agreement to operate and monitor the System.
- 8. The System owner shall furnish the Department any information, which the Department may request regarding the System, within 21 days of the date of receipt of that request.
- 9. The System owner shall provide a copy of this Approval, prior to the signing of a purchase and sale agreement for the facility served by the System or any portion thereof, to the proposed new owner.

10. Prior to installation of the System, the proposed owner shall submit to the Department the written approval of the local approving authority, together with a copy of the complete application submitted to the local approving authority and a complete BRP WP 64b application and obtain DEP written approval.
11. Prior to the issuance of a Certificate of Compliance for the System, the System owner shall record and/or register in the appropriate Registry of Deeds and/or Land Registration Office, a Notice disclosing both the existence of the alternative septic system subject to this Approval on the property and the Department's approval of the System. If the property subject to the Notice is unregistered land, the Notice shall be marginally referenced on the owner's deed to the property. Within 30 days of recording and/or registering the Notice, the System owner shall submit the following to the Department and the local approving authority: (i) a certified Registry copy of the Notice bearing the book and page/instrument number and/or document number; and (ii) if the property is unregistered land, a Registry copy of the owner's deed to the property, bearing the marginal reference.
12. Within fourteen days of the local approving authority's issuance of the Certificate of Compliance, the System owner shall submit a copy of the Certificate of Compliance to the Department.

**V. Conditions Applicable to the Company**

1. By January 31 of each year, the Company shall submit to the Department a report, signed by a corporate officer, general partner or Company owner, that contains information on the System, for the previous calendar year. The report shall state: the number of units of the System sold for use in Massachusetts during the previous year; the address of each installed System, the owner's name and address, the type of use (e.g. residential, commercial, school, institutional), and the design flow; and for all Systems installed since the date of issuance of this Approval for the System, all known failures, malfunctions, and corrective actions taken and the date and address of each such event.
2. The Company shall notify the Director of the Watershed Permitting Program at least 30 days in advance of the proposed transfer of ownership of the technology for which this Approval is issued. Said notification shall include the name and address of the proposed new owner and a written agreement between the existing and proposed new owner containing a specific date for transfer of ownership, responsibility, coverage and liability between them. All provisions of this Approval applicable to the Company shall be applicable to successors and assigns of the Company, unless the Department determines otherwise.
3. The Company shall make available to owners, operators, and installers of the System, in printed and electronic format: minimum installation requirements; an operating manual, including information on substances that should not be

discharged to the System; a protocol for collecting samples; a maintenance checklist; and a recommended schedule for maintenance of the System

4. The Company shall develop and submit to the Department within 60 days of the effective date of this Approval a standard protocol essential for consistent and accurate measurement of performance of installed Systems, including procedures for sample collection and analysis of the System. The protocol shall be in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater.
5. The Company shall institute and maintain a program of operator training and continuing education. The Company shall maintain and annually update, and make the list of qualified operators available by March 1<sup>st</sup> of each year. The Company shall also make the list known to the local approving authorities, the Department and users of the technology.
6. The Company shall furnish the Department any information that the Department requests regarding the System, within 21 days of the date of receipt of that request.
7. Prior to its sale of the System, the Company shall provide the purchaser with a copy of this Approval. In any contract for distribution or sale of the System, the Company shall require the distributor or seller to provide the purchaser of the System, prior to any sale of the System, with a copy of this Approval.
8. For at least the first 18 months of operation, the Company shall be responsible for operating, maintaining and monitoring the Systems in accordance with Section III, item 4 of this Approval. The Company shall submit monitoring data and O & M inspection results to the Department and the local approving authority within 45 days of each sampling date and each inspection date. The inspection results must be recorded on a DEP approved inspection form and a technology checklist. Accurate completion of the forms shall be the responsibility of the Company
9. For nitrogen reducing Systems the effluent discharge concentrations shall meet or exceed secondary treatment standards of 30 mg/L CBOD<sub>5</sub> and 30 mg/L TSS. The effluent pH shall not be less than 6.0 or more than 9.0 standard units. The TN concentration in the effluent discharged from the System shall not exceed 19 mg/L for Systems serving residential facilities with design flows less than 2,000 gpd or 25 mg/L for Systems serving residential facilities with design flows of 2,000 gpd or greater and all Systems serving non-residential facilities.
10. During the first 18 months of operation, excluding the first three months of startup operations, if the effluent concentration from the System exceeds the applicable TN limit on two consecutive sampling events, the Company shall within 60 days submit a report to the Department explaining the reasons for the exceedances with recommendations for operational or design changes to prevent future violations.



11. For systems installed to demonstrate reduced SAS, effluent discharge concentrations from the System shall not exceed 15 mg/L CBOD<sub>5</sub>, 10 mg/L TSS and a minimum of 95 percent Fecal Coliform removal must be achieved. In addition:
  - i. A groundwater monitoring well shall be installed within 10 feet and directly downstream of the SAS in accordance with the Department's published guidelines and a groundwater piezometer or other DEP approved device for measuring water depth shall be installed within the SAS. The monitoring well shall be tested at the same frequency as listed in Section III item 4 and for the following parameters: Fecal Coliform and ammonia. Each time the System is monitored, the water meter reading, the groundwater elevation in the monitoring well and the water level in the groundwater piezometer shall be recorded.
12. During the first 18 months of operation, excluding the first three months of startup operations, if the effluent concentration for the System installed to demonstrate reduced SAS exceeds 15 mg/L CBOD<sub>5</sub>, 10 mg/L TSS or fecal coliform reduction is less than 95 percent on two consecutive sampling events, the Company shall within 60 days submit a report to the Department explaining the reasons for the exceedances with recommendations for operational or design changes to prevent future violations.
13. Within 30 days of the end of the first 18 months of operation the Company shall submit a summary report on each system describing the operations of the system, any changes in operation or design that were made during the Piloting period, the final results of the Piloting program for that system and whether the system met the effluent limits for the previous 12 months of operation. That report shall also include either recommendations for approving and ending the Piloting program for that system or recommendations for continuing Piloting for any system that has not performed as planned.
14. The Department will review the report in item 13 above and determine if additional Piloting of the system is required. The Company shall either continue the Piloting program for that system as required by the Department or remove the system and replace it with a fully complying Title 5 system. If the Department determines that the system has performed at the relevant level for at least 12 months, the Company can turn the responsibility for operation and monitoring of the system over to the owner in accordance with Section IV, item 5 of this Approval.
15. If the Company wishes to continue this Piloting Approval after its expiration date, the Company shall apply for and obtain a renewal of this Approval. The Company shall submit a renewal application at least 180 days before the expiration date of

this Approval, unless permission for a later date has been granted in writing by the Department.

**VI. Reporting**

1. All notices and documents required to be submitted to the Department by this Approval shall be submitted to:

Director  
Watershed Permitting Program  
Department of Environmental Protection  
One Winter Street - 6th floor  
Boston, Massachusetts 02108

**VII. Rights of the Department**

1. The Department may suspend, modify or revoke this Approval for cause, including, but not limited to, non-compliance with the terms of this Approval, non-payment of the annual compliance assurance fee, for obtaining the Approval by misrepresentation or failure to disclose fully all relevant facts or any change in or discovery of conditions that would constitute grounds for discontinuance of the Approval, or as necessary for the protection of public health, safety, welfare or the environment, and as authorized by applicable law. The Department reserves its rights to take any enforcement action authorized by law with respect to this Approval and/or the System against the owner, or operator of the System and/or the Company.

**VIII. Expiration date**

1. Notwithstanding the expiration date of this Approval, any System sold and installed prior to the expiration date of this Approval, and approved, installed and maintained in compliance with this Approval (as it may be modified) and 310 CMR 15.000, may remain in use unless the Department, the local approving authority, or a court requires the System to be modified or removed, or requires discharges to the System to cease.